



Announcing The World's First x86 Multi-Core Processors

*Dual-Core AMD Opteron™ processors and
Dual-Core AMD Athlon™ 64 X2 processors*

April 21, 2005

AMD Dual-Core Processor Overview

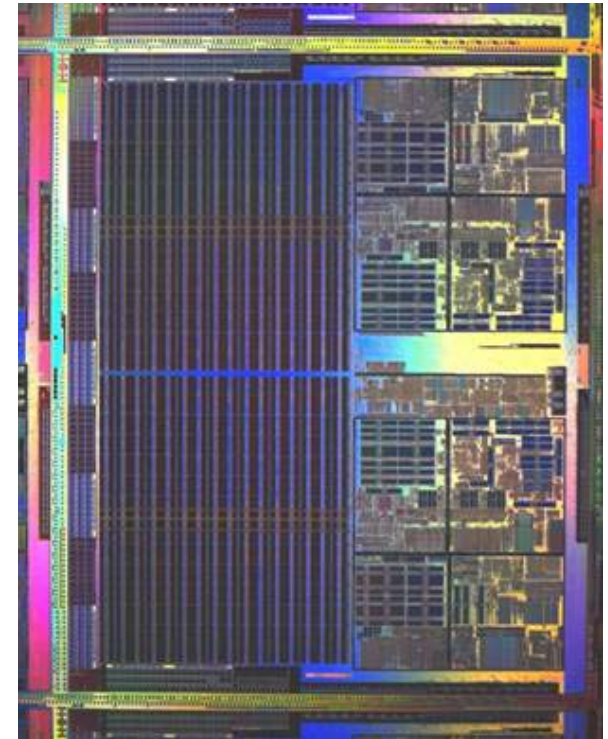
Server and client **dual-core parts** will enable AMD to continue to drive **technology leadership** in the server, workstation, and desktop markets:

AMD firsts for dual core:

- **First** to tape out x86 dual-core design (June 2004)
- **First** to demo an x86 dual-core part (August 2004)
- **First** to launch and ship x86 dual-core parts for servers and workstations (April 21, 2005)

Dual-Core AMD Opteron™ and AMD Athlon™ 64 X2 Processors:

- Dual-Core AMD Opteron™ processor **compatible** with existing 940-pin sockets that support 90nm with a BIOS update, streamlining upgrade paths while increasing performance and value.
- AMD Athlon™ 64 X2 Dual-Core processors **compatible** with existing 939-pin sockets with BIOS update.
- Completely **compatible** with x86 and AMD64 applications while benefiting multi-threaded environments.
- Based on AMD64 technology, designed from the ground up for multi-core.



Introducing Dual-Core AMD Opteron™ Processors

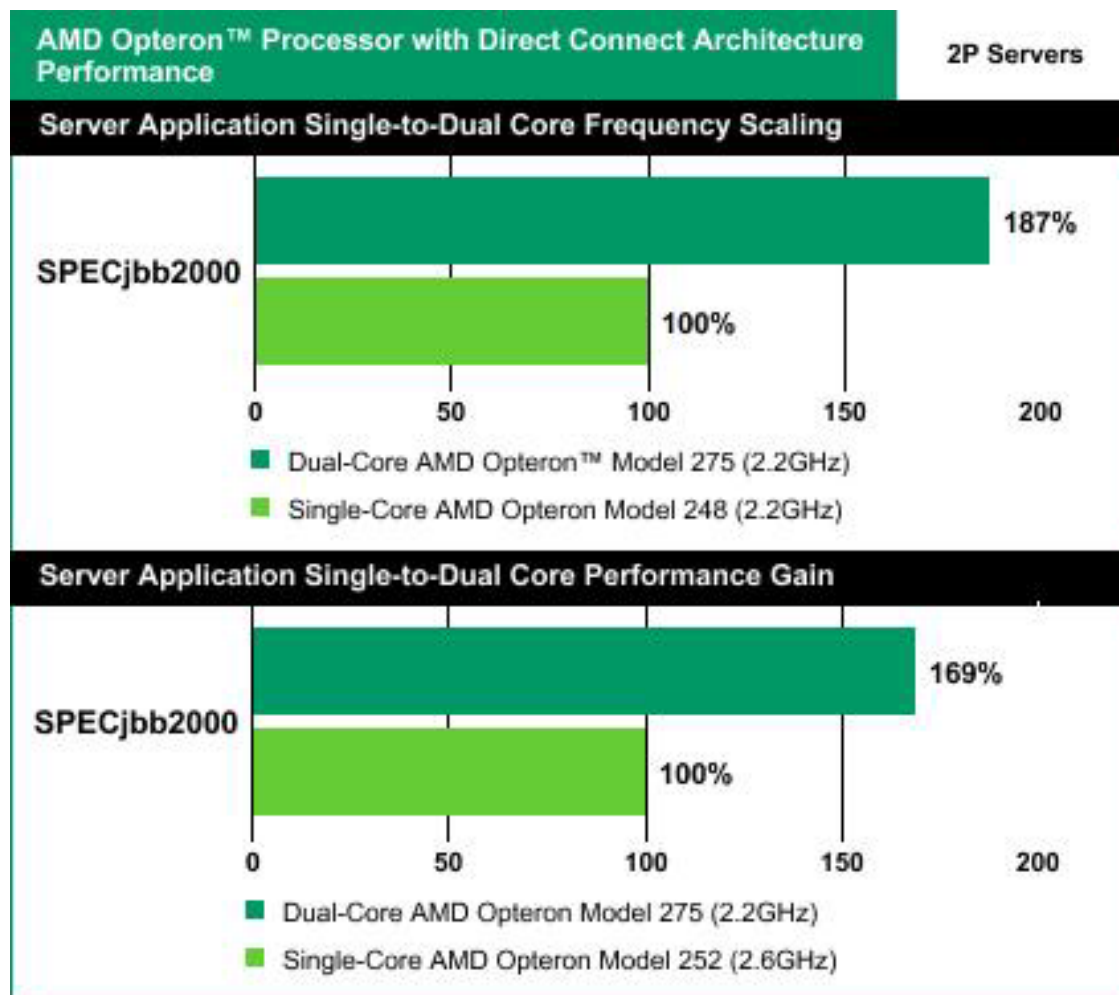


AMD is introducing six new models of the AMD Opteron™ processor:

- Available immediately:
 - Model 865 (1.8 GHz)
 - Model 870 (2.0 GHz)
 - Model 875 (2.2 GHz)
- Available late May:
 - Model 265 (1.8 GHz)
 - Model 270 (2.0 GHz)
 - Model 275 (2.2 GHz)
- Works within existing power envelope



Breaking through performance ceilings



The **Dual-Core AMD Opteron™ processor** Model 275 **bested** the highest performing single-core 2P AMD Opteron processor Model 252 by **nearly 70 percent** and the single-core Model 248 by **nearly 90 percent**.

The SPECjbb2000 benchmark measures the performance of Java application servers, commonly used in ERP, CRM, e-business and other tiered applications in which a web browser is used to access information contained in a database.

Dual-Core AMD Opteron™ Processor Pricing



Pricing for entry-level Dual-Core AMD64 processors overlap with current single-core processors that are in market today, making the shift to dual-core technology an easy decision for customers.

- The AMD Opteron™ processor 800 Series – for four- to eight-way servers
 - Price/performance advantage with equivalently performing competitive products
 - Seamless pricing migration to dual-core processors
- The AMD Opteron processor 200 Series – for two-way servers and workstations
 - Price/performance parity with equivalently performing competitive products
 - Seamless pricing migration to dual core

AMD Opteron™ processor 800 Series	
AMD Opteron 875	\$2,649
AMD Opteron 870	\$2,149
AMD Opteron 865	\$1,514
AMD Opteron 852	\$1,514
AMD Opteron 850	\$1,165
AMD Opteron processor 200 Series	
AMD Opteron 275	\$1,299
AMD Opteron 270	\$1,051
AMD Opteron 265	\$851
AMD Opteron 252	\$851
AMD Opteron 250	\$690

Dual-Core AMD Opteron™ Architecture

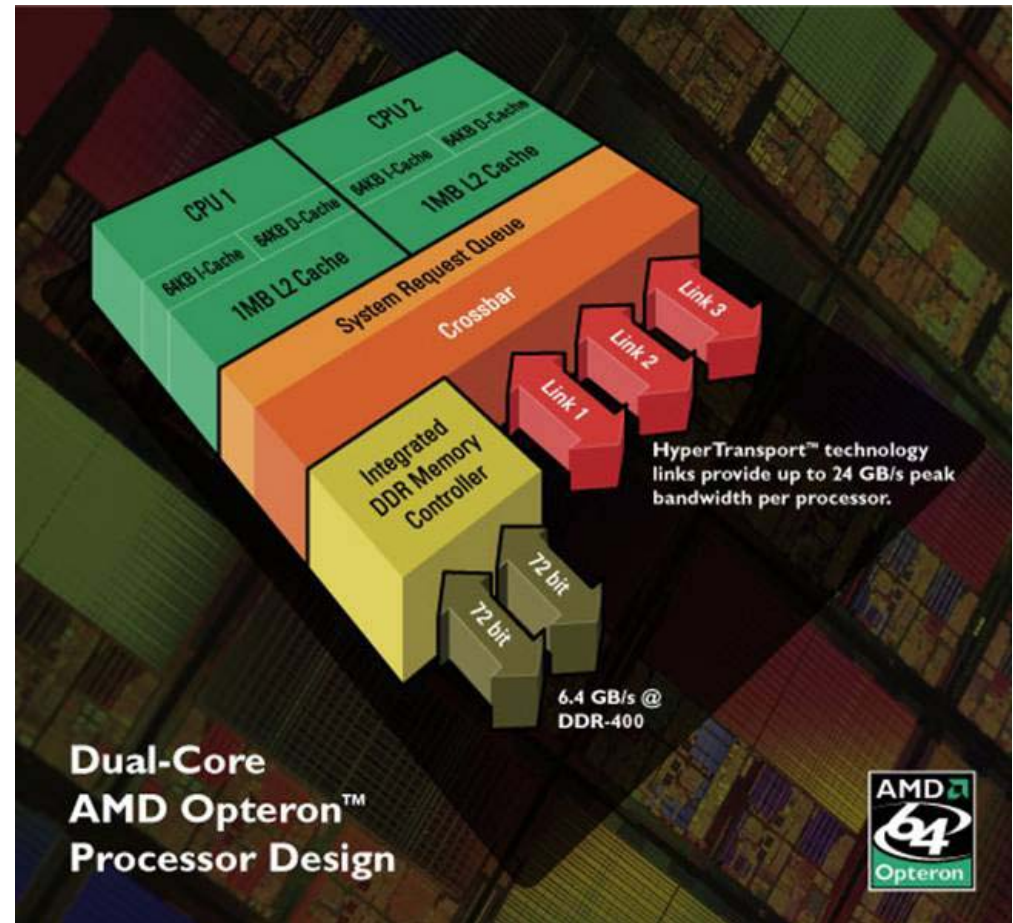


Designed for Dual Core

940-Pin Socket Compatible

No Changes in Power

Non-disruptive migration



Data-Center Benefits

- Dual-core processors enable customers to increase their computing capacity without increasing power requirements
 - Providing the best performance/watt
- Compute-intensive applications leverage the memory bandwidth and additional computing power of dual-core processors
 - Results in higher performance and better throughput
- Rack-dense and blade server designs - tradeoff of balancing power verses performance demands
 - Dual-core processors offer the perfect balance between performance and density

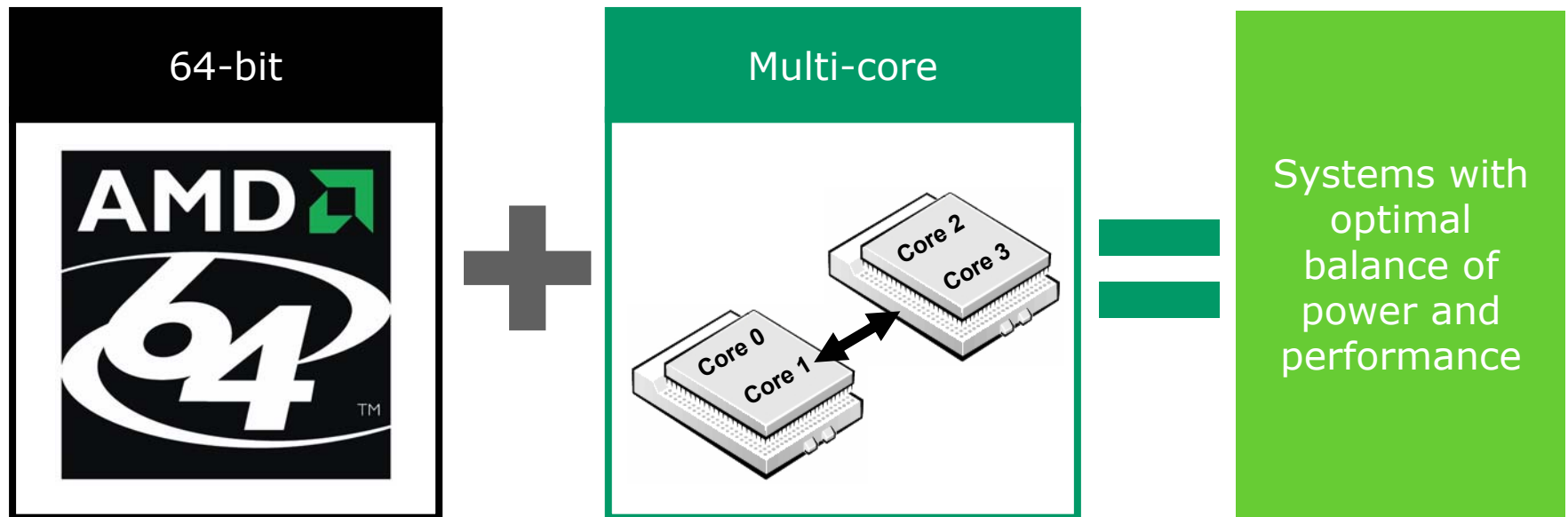


Dual-core processors offer the optimal balance between performance and density for rack dense and blade server designs.

Multi-core x86 processing and the 64-bit OS



An evolutionary step with a revolutionary impact:



Introducing the AMD Athlon™ 64 X2 Dual-Core Processor



*Enabling
businesses
and
consumers to
do more in
less time*

- **Model Numbers**

- AMD Athlon™ 64 X2 Dual-Core processors 4200+, 4400+, 4600+, and 4800+.

- **Availability**

- AMD is currently shipping samples of the AMD Athlon X2 Dual-Core processors to leading OEMs worldwide and will be launching in June.
- Both desktop PCs and desktop-replacement notebooks will be available.

- **Pricing**

- AMD Athlon 64 X2 Dual-Core processors 4800+, 4600+, 4400+ and 4200+ are priced at \$1001, \$803, \$581, and \$537 respectively.

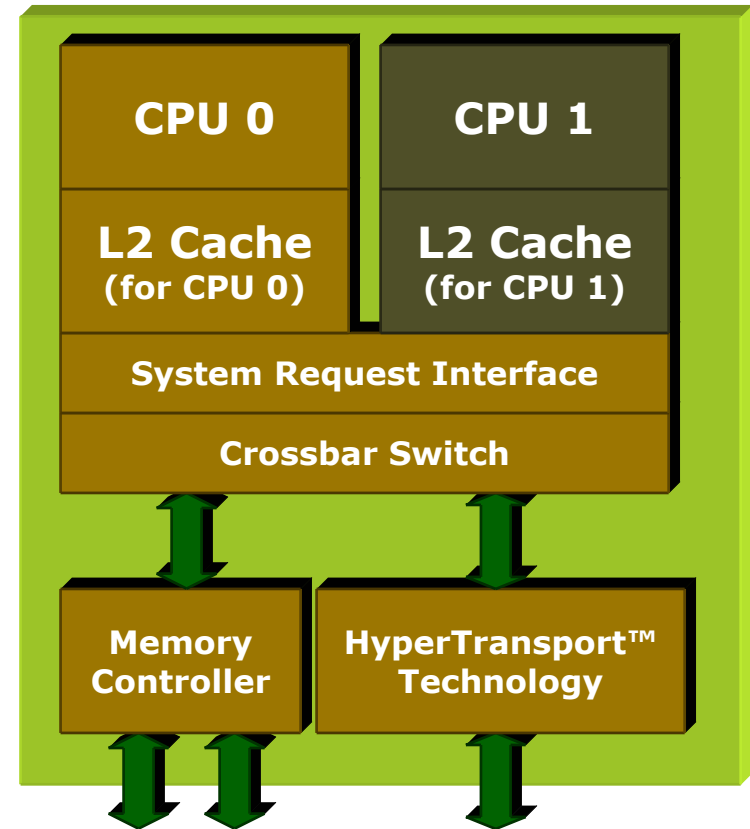


AMD Athlon™ 64 X2 Processor Models

Model	Frequency	L2 Cache	Pricing
4800+	2.4 GHz	1MB + 1MB	\$1001
4600+	2.4 GHz	512KB + 512KB	\$803
4400+	2.2 GHz	1MB + 1MB	\$581
4200+	2.2 GHz	512KB + 512KB	\$537

AMD64 Dual-Core Processor Design

- AMD64 designed from the ground up for multiple cores
 - True dual core, with two CPU cores on one die
 - 90nm die ~ 233 million transistors
 - Inter-core communication at processor speed
 - Access via crossbar to memory controller and HyperTransport™ technology link
- Designed for existing 939 infrastructure
 - Requires only BIOS update
 - Standard heat sinks and power
- Advanced features of AMD64 technology
 - Enhanced Virus Protection with Microsoft® Windows® XP SP2*
 - Cool'n'Quiet™ technology
- Dual-core benefits available on today's software with no changes
 - Microsoft® Windows® XP Home & Pro edition (SP2)
 - All versions of Linux



**AMD Athlon™ 64 X2
Dual-Core Processor Design**

Smash the Hourglass!

Do more in less time with the AMD Athlon™ 64 X2 Dual-Core Processor

- **Performance and TRUE Multitasking**

The AMD Athlon™ 64 X2 Dual-Core processor delivers businesses and consumers exceptional multi-tasking capabilities and increased performance on digital media.



- **Satisfying the demand for more digital media**

The AMD Athlon 64 X2 processor enables the digital lifestyle, blazing the way for creating engaging content and viewing digital memories.



- **Security and Productivity**

Dual-core technology is like having one processor running protection programs in the background while a second runs the applications you want to work on – making computing fast again.



AMD Desktop 2005 Processor Positioning



Gaming Segment

- Catering to the extreme gamer and enthusiast
- Ideal for 3D games and single-threaded applications



Prosumer & Digital Media Segments

- Designed for sophisticated power users who run multiple processor-intensive applications simultaneously
- Ideal for digital content creation and entertainment consumption



Mainstream Segment

- Designed for the mainstream consumer and commercial market
- Competitive features, performance, and price



Value Segment

- Designed for the budget-conscious buyer
- Offers better performance while still priced to compete
- Lowest possible cost and most cost-effective infrastructure

Client Dual-Core Competitive Comparison



AMD Athlon™ 64 X2 Processor

- Existing platform support
 - No design changes
 - No heat sink updates
 - No hidden costs!
- True on-die dual core
 - AMD64 architecture
 - Die speed inter-core communication
 - Leverages features of AMD Athlon™ 64 processor, including Enhanced Virus Protection with Microsoft® Windows® XP SP2* and Cool'n'Quiet™ technology

Intel Pentium D

- Requires new boards
 - 119A → needs new voltage regulator module (VRM)
 - 130W → new heat sink & HOT!
 - Added cost to end user!
- Cores linked only by package
 - Limited by FSB interface
 - FSB speed inter-core communication
 - Bottlenecked!
 - Advanced features only available on high-end models

Summary

- **AMD Opteron™ processor**

- Dual-Core AMD Opteron™ processor, Models 865, 870 and 875 available immediately
- Dual-Core AMD Opteron processor, Models 265, 270 and 275 available late May (+30 days)



- **AMD Athlon™ 64 X2 processor**

- AMD Athlon™ 64 X2 processors shipping this quarter
- AMD Athlon™ 64 X2 processors 4200+, 4400+, 4600+ and 4800+ available in June



- **Launch Partners**

- Tier 1 OEMs, system builders and channel infrastructure partners

Trademark Attribution

* Enhanced Virus Protection will by default only protect the user's Windows® operating system. After properly installing the appropriate Windows release, users must enable the protection of their applications and associated files from memory buffer overrun attacks. Contact your application software vendor for information regarding use of the application in conjunction with Enhanced Virus Protection. AMD and Microsoft strongly recommend that users continue to use third party anti-virus software as part of their security strategy.

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- Two AMD Opteron™ processors Model 275 with 2 x 1MB L2 cache in Tyan S4882 Thunder K8QS Pro Motherboard, 4GB memory, 1 x 36GB SCSI hard drive, IBM J2RE 1.4.2 Windows 32 build cn142-20040926 (JIT enabled: jitc), Microsoft® Windows® Server 2003 Enterprise Edition.
- Two AMD Opteron™ processors Model 252 with 1MB L2 cache in Tyan S4882 Thunder K8QS Pro Motherboard, 4GB memory, 1 x 36GB SCSI hard drive, IBM J2RE 1.4.2 Windows 32 build cn142-20040926 (JIT enabled: jitc), Microsoft® Windows® Server 2003 Enterprise Edition.
- Two AMD Opteron™ processors Model 248 with 1MB L2 cache in Tyan S4882 Thunder K8QS Pro Motherboard, 4GB memory, 1 x 36GB SCSI hard drive, IBM J2RE 1.4.2 Windows 32 build cn142-20040926 (JIT enabled: jitc), Microsoft® Windows® Server 2003 Enterprise Edition.